

Teknoloji Evriminden, 4. Endüstri Devrimine...

İNFOMA
TEKNOLOJİ



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Program



Introduction,



Technological Evolution and Transformation



4th Industrial Revolution,



Adoptions and Implementation Examples,



**Bilimsel, Teknik ve Mühendislik Alanında
Katma Değerli Çözümler...**

28 Yıllık Sektör Liderliği

Mustafa CERAN

■ Konya'da doğdu,

■ Eğitim;

- ❖ Yıldız Üniversitesi, Elektrik Mühendisliği, 1978,
- ❖ Oslo Üniversitesi, Computer Science, 1982,



■ Tecrübe; (38 Yıl)

❖ Norveç (1978 – 1988):



❖ Türkiye (1988 – Devam):

■ Uzmanlıklar ve İlgi Alanları;

- ❖ Super Computers, Paralel Processing, 4GL, Sanal Gerçeklik / AR,
- ❖ Bilgisayar Destekli Mühendislik, PLM, QLM, ePLM, IoT, Endüstri-4.0

■ Uygulamalar, Sektörler ve Bazı Referanslar;

- ❖ Savunma, Uzay/Uçak, Otomotiv, Elektronik, Makina İmalat, Retail,
- ❖ Aselsan, TAI, Havelsan, Otokar, Tümosan, Hidromek, Pegasus, VIKO, vb.

The Birth of Industry 4.0



Forces & Factors, behind this transformation: Globalization, Competitiveness, Economy, Recessions, Suppliers, Energy, New Technologies like IoT etc...

Industry-40, Cyber-Physical-Systems (CPS)

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Endüstri-4.0'ın Doğuşu;

- *Industry 4.0 first used in Hannover Fair in 2011 as a result of an initiative to «**secure the future of German manufacturing industry**». And following initial potentials are identified;*
- Meeting individual customer requirements,
- Flexibility,
- Optimised decision-taking,
- Resource productivity and efficiency,
- Creating value opportunities through new services,
- Responding to demographic change in the workplace,
- Work-Life-Balance,
- A high-wage economy that is still competitive,

Almanya'da I40 Gelişimi için Organizasyonel Yapılanma

Working Groups for thematic priorities



Working Group 1:
**Reference Architectures,
Norms and Standardisation**

Chair:
Dr. Peter Adolphs,
Pepperl + Fuchs

Working Group 2:
Research and Innovation

Chair:
Johannes Diemer,
Hewlett Packard Enterprise

Working Group 3:
**Security of Interconnected
Systems**

Chair:
Michael Sandner,
Volkswagen AG

Working Group 4:
Legal Framework

Chair:
Dr. Hans-Jürgen Schlinkert,
ThyssenKrupp

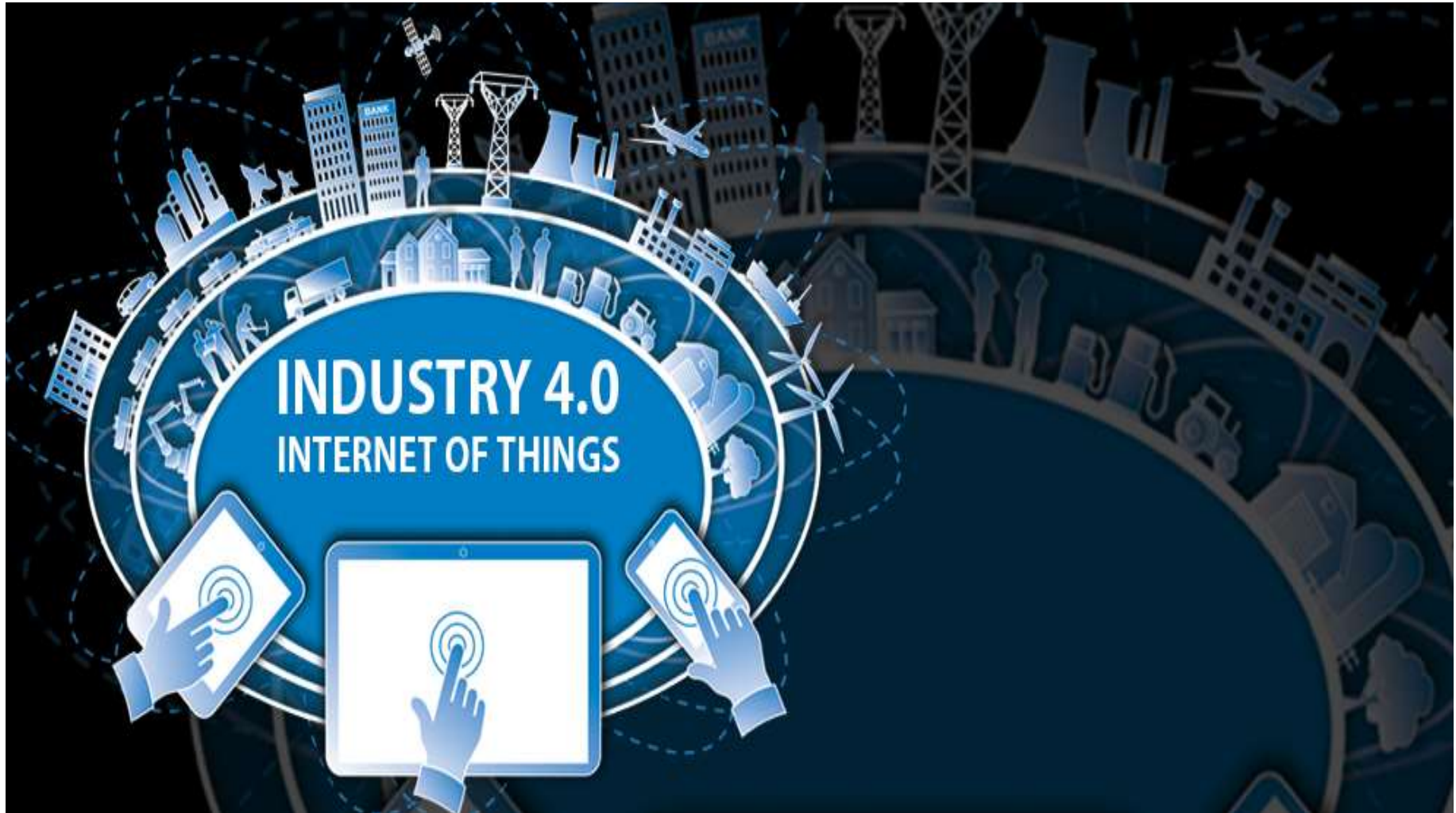
Working Group 5:
**Employment, Qualification and
Life-Long Learning**

Chair:
Dr. Constanze Kurz
IG Metall

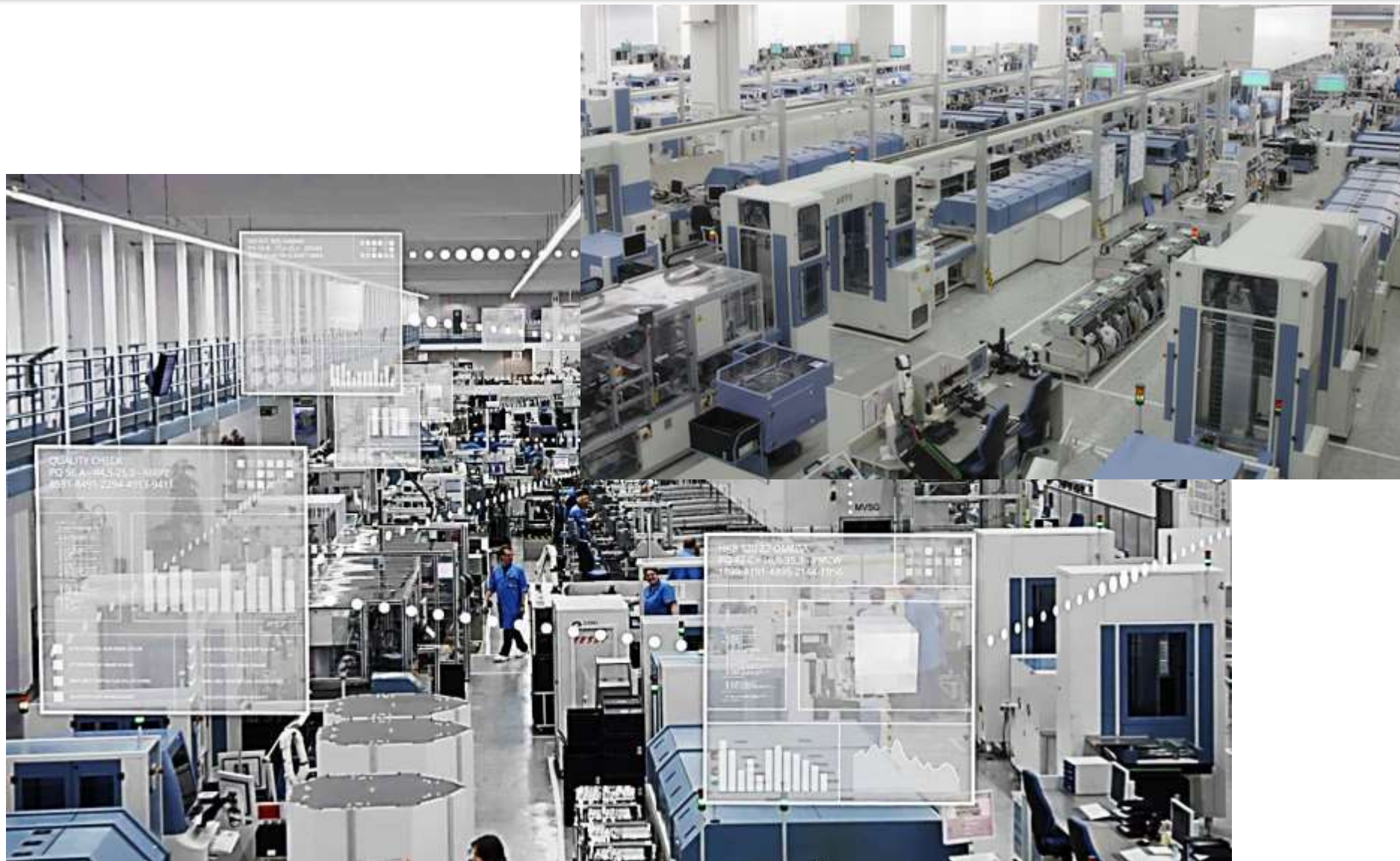
- Open work forum set up by representatives from all participating partners
- Criteria for participation: subject specific expertise together with an effective mandate from the represented organization and a regional multiplication effect

Industry 4.0 = Cyber-Physical Systems (CPS)

It is expected that, it will impact every industry in every country



Smart Factories: Fully Integrated Machines & Things



Smart-Factories

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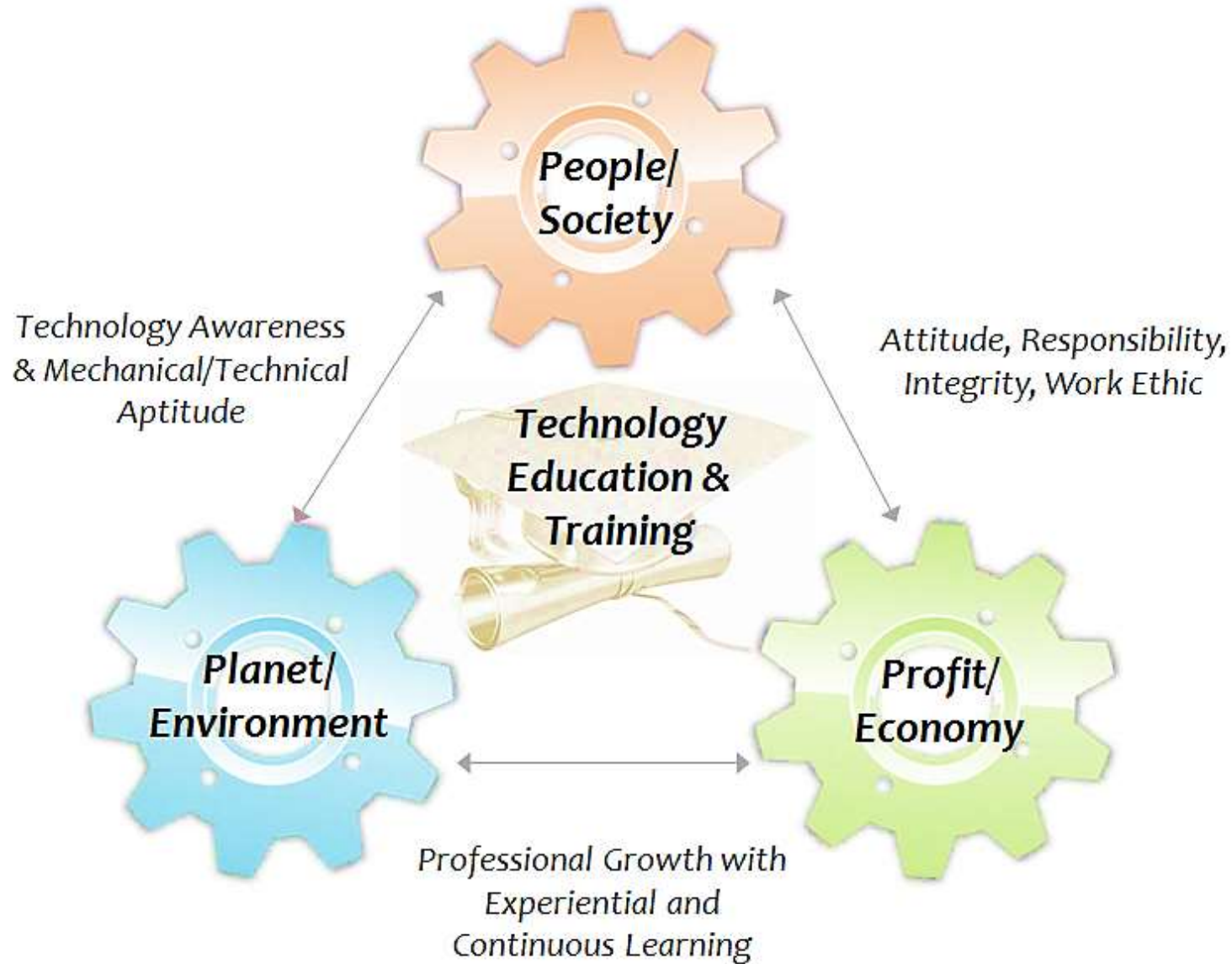
Cyber-Physical Manufacturing



Maserati Production Line <https://www.youtube.com/watch?v=MJg5YR9klx4>

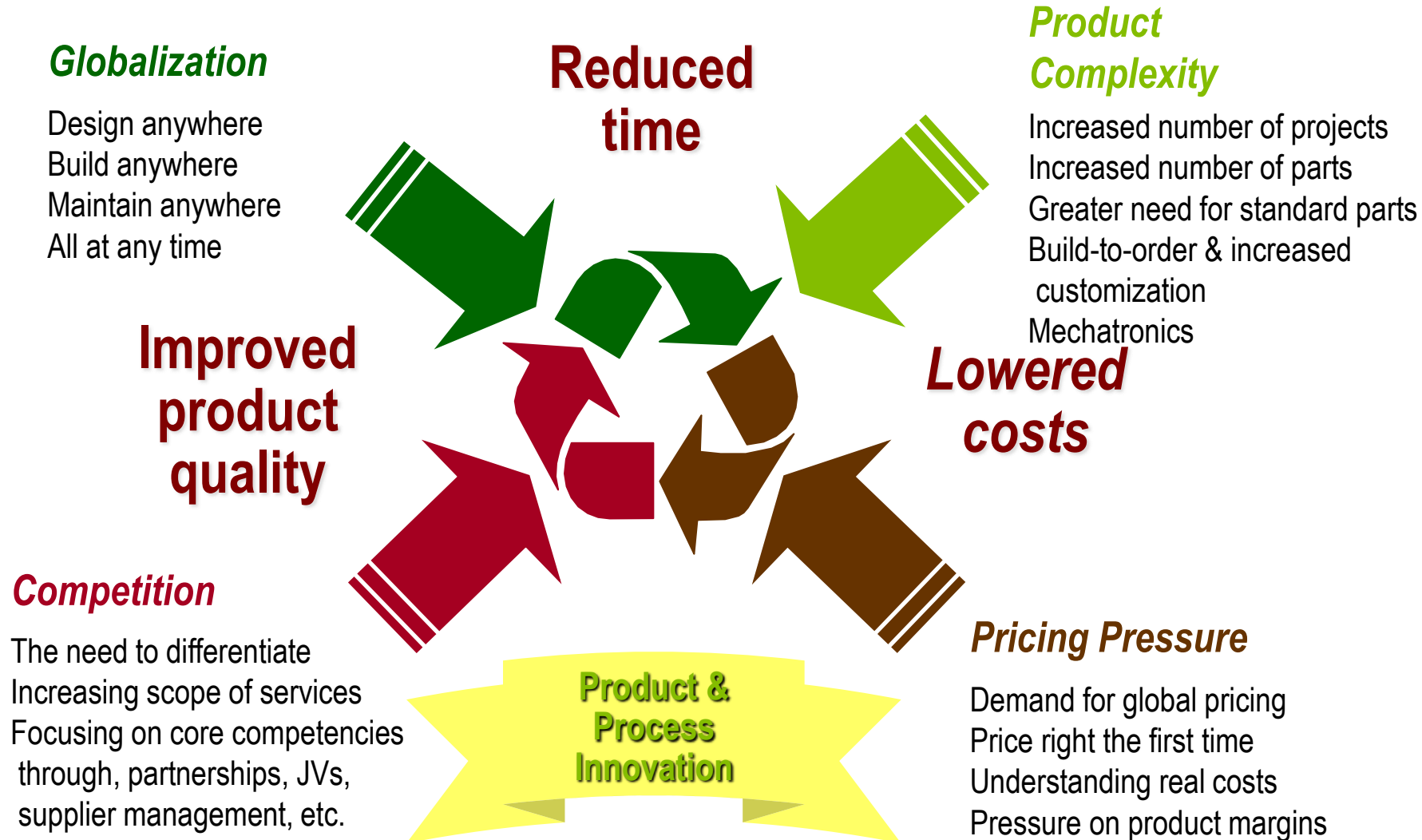
Technology Transformation

Creating Sustainable Manufacturing Environments

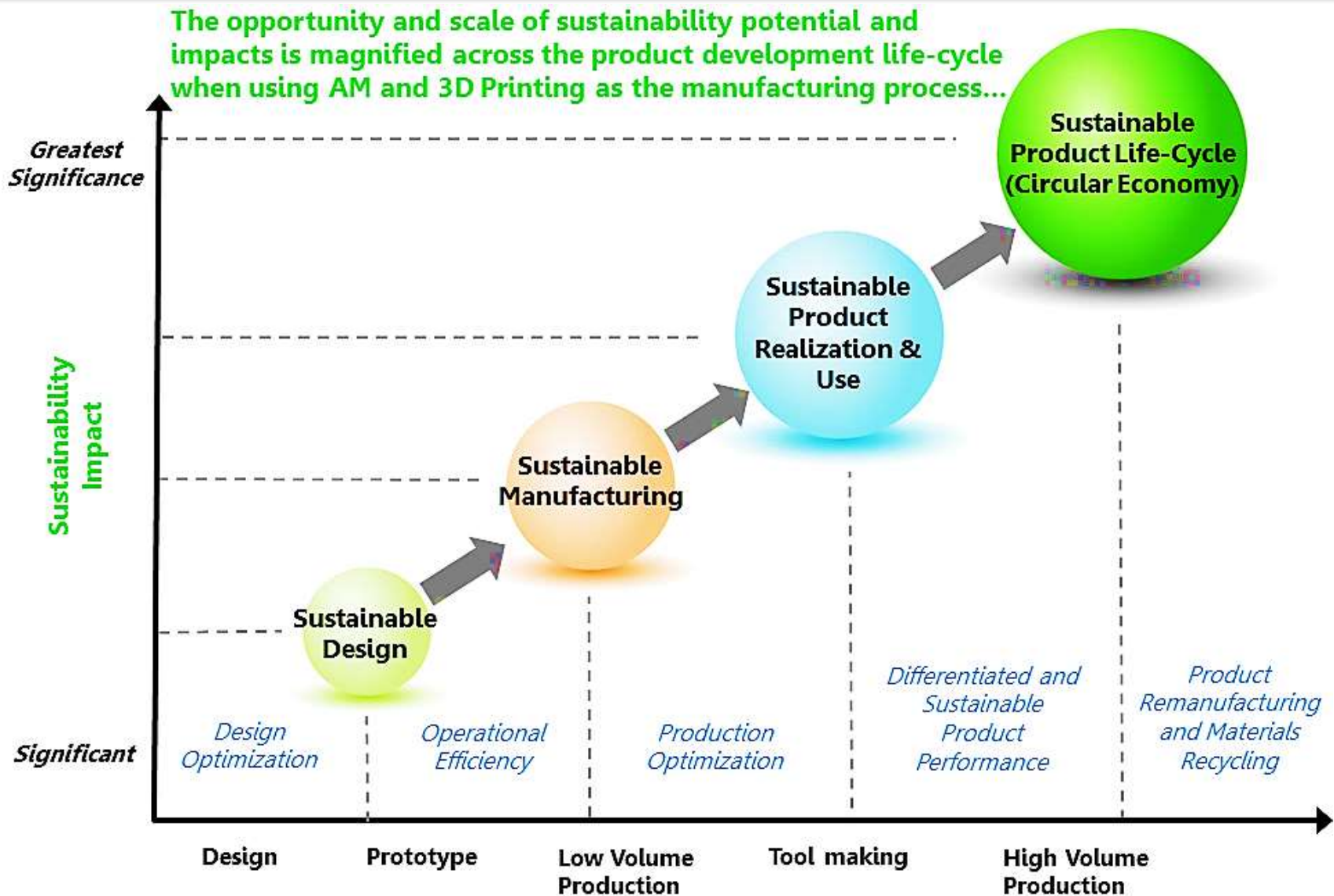


It's a Constant Challenge & Constant Change!

Time, Cost, and Quality equation is no longer sufficient



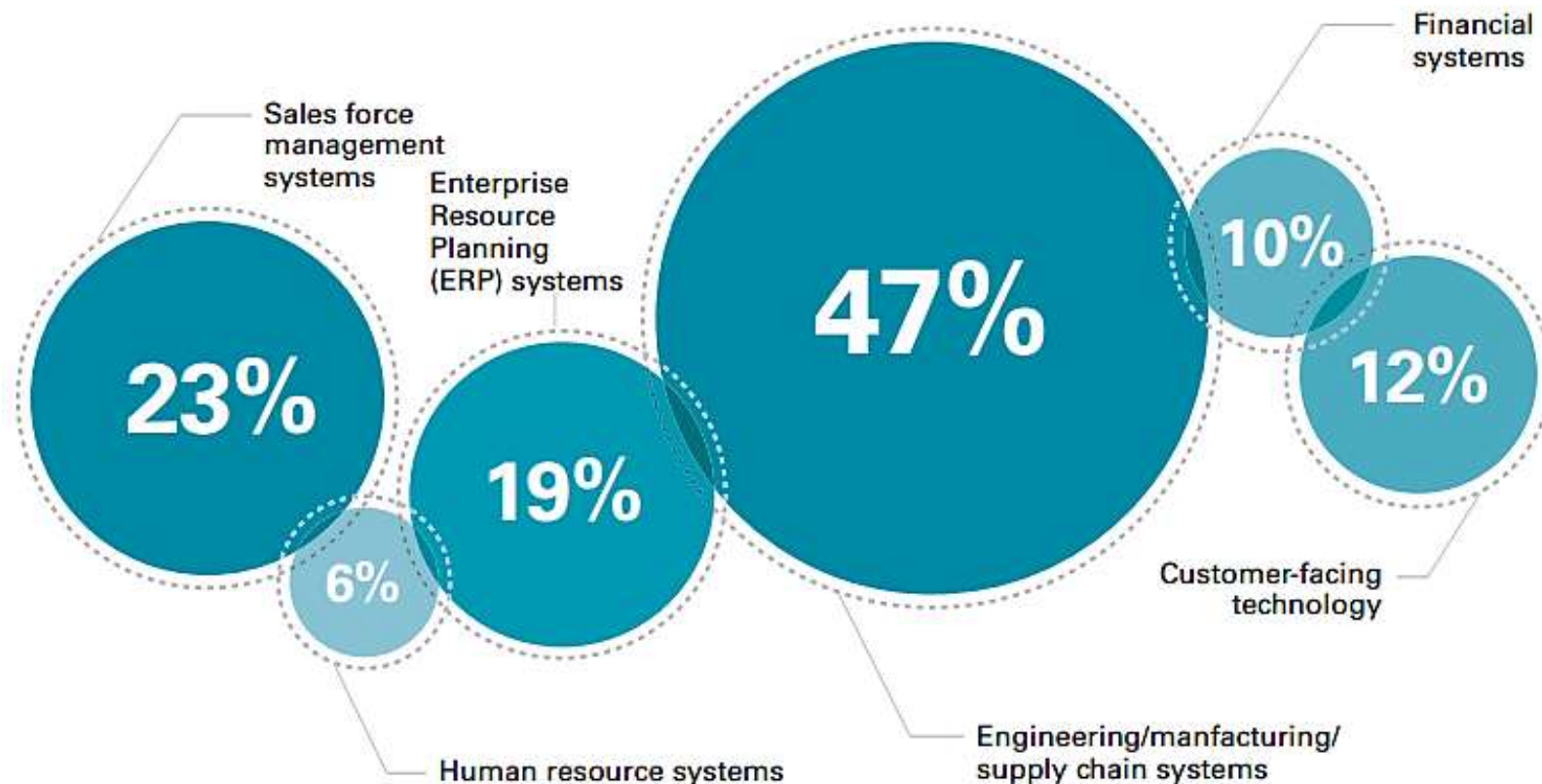
Manufacturing's role is changing



Global Manufacturing Outlook ; KPMG

Preparing for battle: Manufacturers get ready for transformation

What are respondents allocating 20 percent or more of their total technology spend on?



Source: Forbes survey, January 2015.

Oxford Economics on Manufacturing Transformation

About Oxford Economics

- **Oxford Economics** was founded as a joint venture with Oxford University, and it is now one of the world's foremost independent global research firms.
- Headquartered in Oxford, England, with offices throughout the world, we employ more than **80 professional economists**.
- Our global team is **highly skilled** in a full range of research techniques, from econometric modeling and impact analysis to executive surveys and interviews.
- Oxford Economics is a **key adviser** to corporate, financial, and government decision-makers
- We have over 700 international clients, including manufacturers such as GE, Coca-Cola, Boeing, Rolls Royce, Siemens, GM, and Samsung.



Manufacturing Transformation

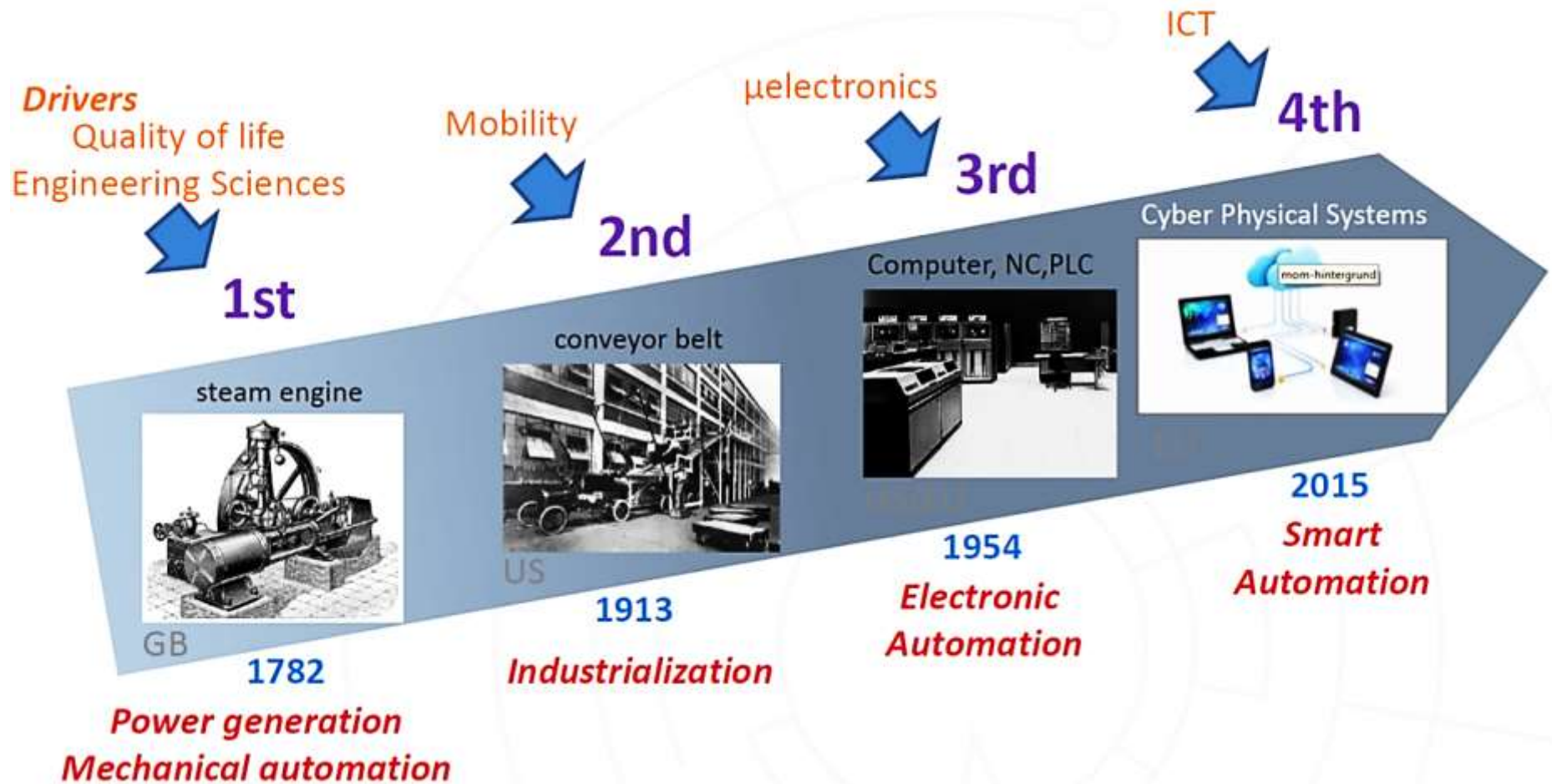
Achieving competitive advantage
in a changing global marketplace

Impact on Manufacturing



Over two-thirds of manufacturing firms will undergo significant business process transformation to prepare for future market demands over the next three years.

The 4th Industrial Revolution : Industry 4.0



What is 4.Industrial Revolution?

According to: Wikipedia;

Strong customization of products under the conditions of high flexibility (mass-) production. The required automation technology is improved by the introduction of methods of **self-optimization, self-configuration, Self-diagnosis, cognition and intelligent support of workers** in their increasingly complex work.

According to: Nicholas Davis, head of Society and Innovation;

Cyber-physical systems which, represent entirely new ways in which technology becomes embedded within societies and even our human bodies”.

Say Hello to Industry-4.0 Smart Factories !



Key Components;

- Simulation,
- Cybersecurity,
- Augmented Reality,
- Autonomous Robots,
- Big Data & Analytics,
- Artificial Intelligence,
- Additive Manufacturing,
- IoT - The Internet of Things,
- Horizontal and Vertical System Integration



Things to Tighten the Link Between IT and OT

IT and OT converge

Digital Technology

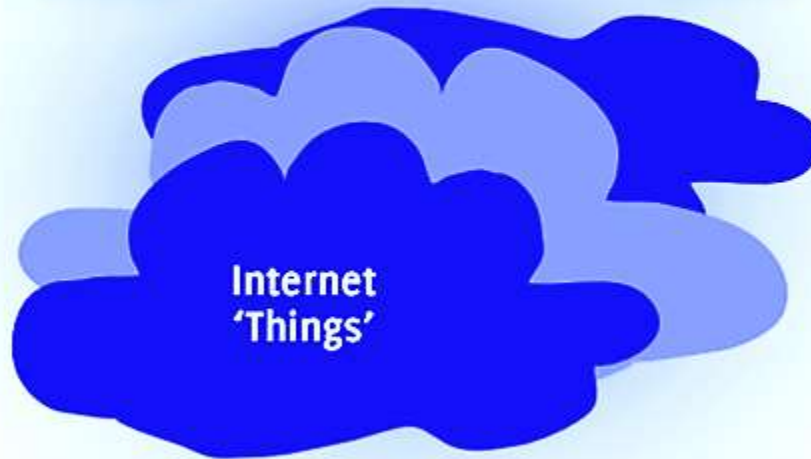
Information Tech
Business Process
Automation
& Office Automation



+



Operational Tech
Industrial Process
Automation & Factory
Automation



Engagement

Predictive Maintenance

M & M
Machine-to-Machine

Key Components & Technologies

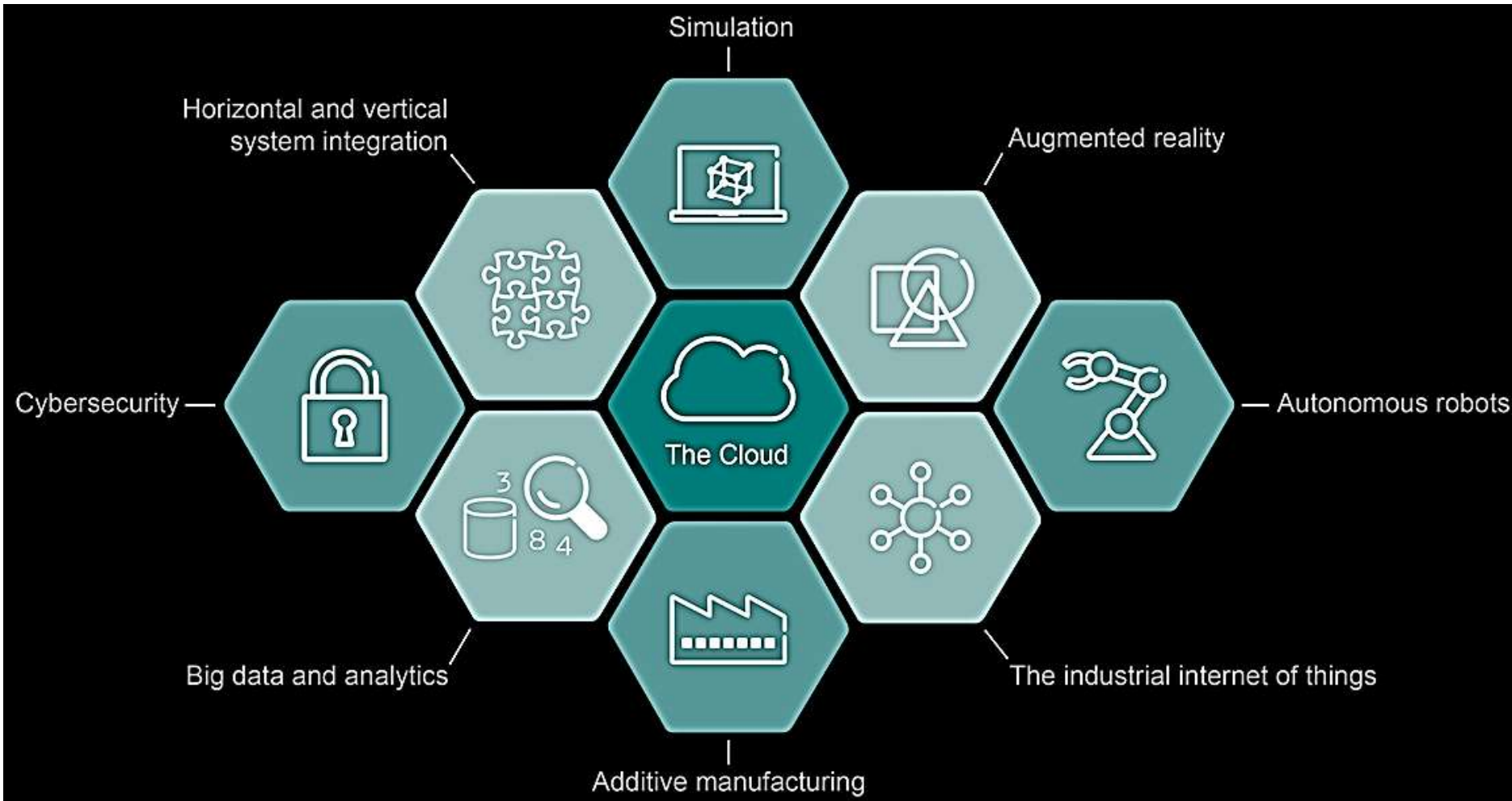


<http://www.iotonlinestore.com/IoT-by-Numbers/10>

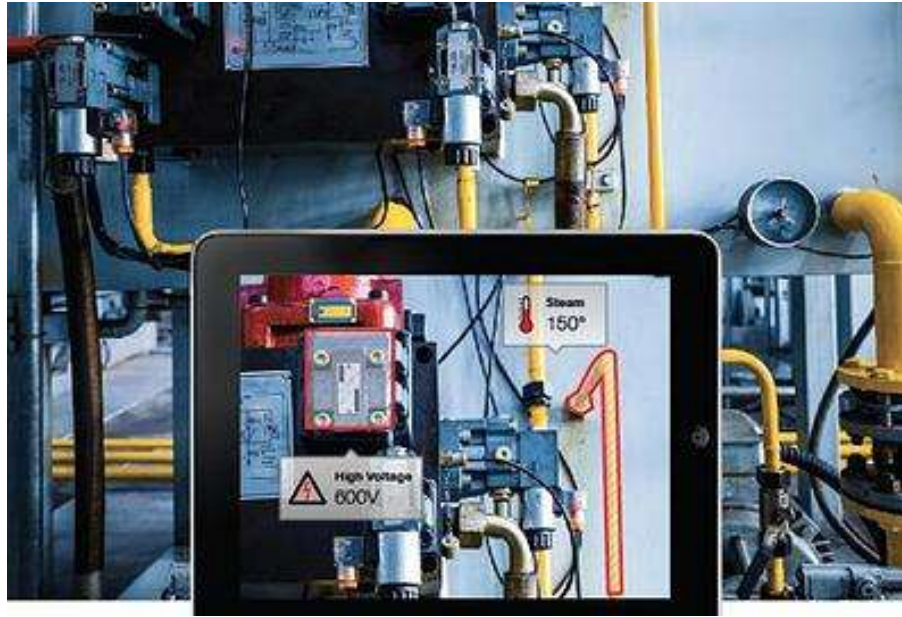
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I4.0 Key Components & Technologies

Some of the key components & technologies under rapid development



Augmented Reality (Arttırılmış Gerçeklik)



Augmented Reality, 2D-to-3D

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IoT – Internet of Things; Internet of Everything



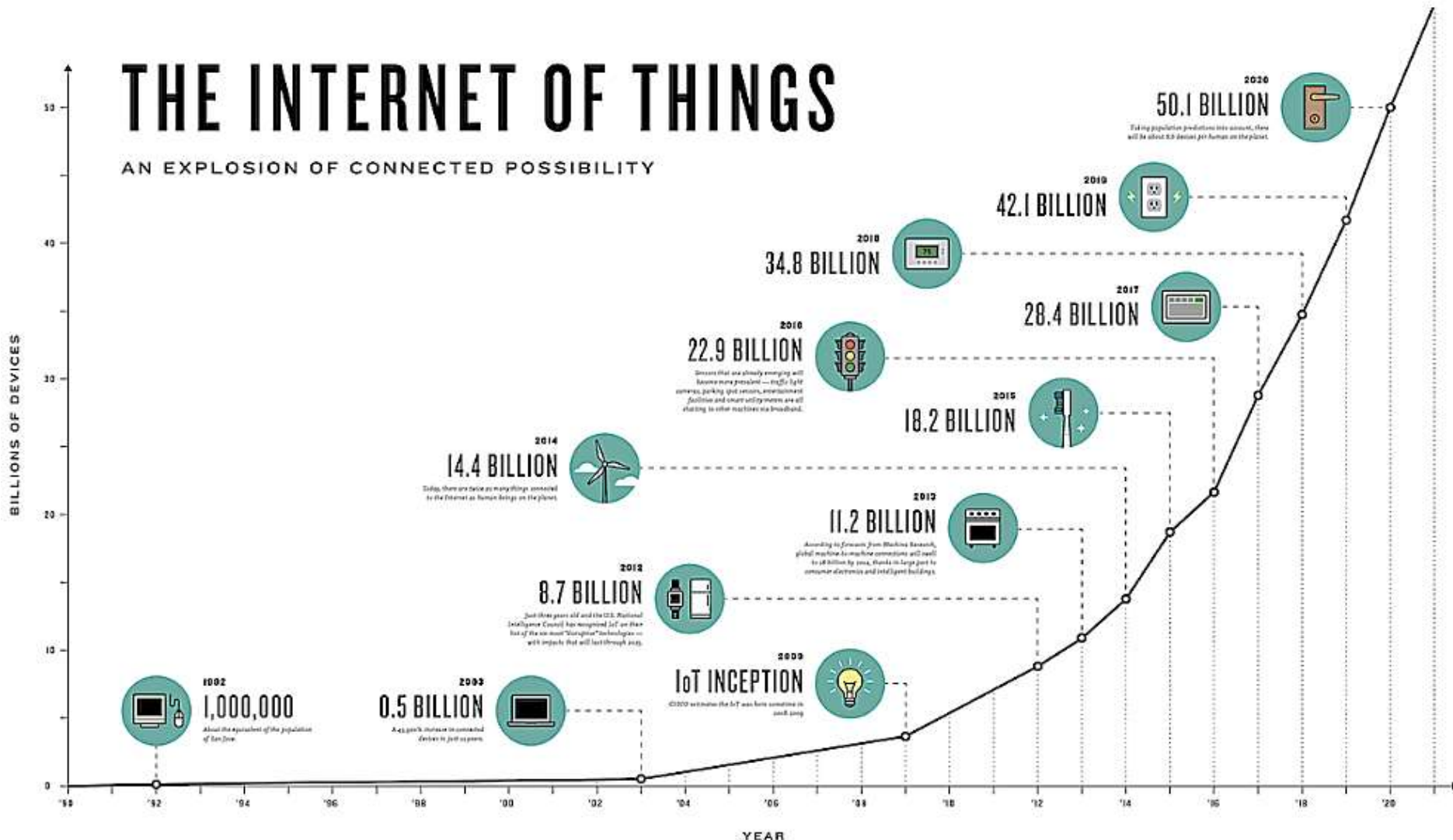
Smart Home with IoT



Expected connected devices by 2020 : 50 Billion

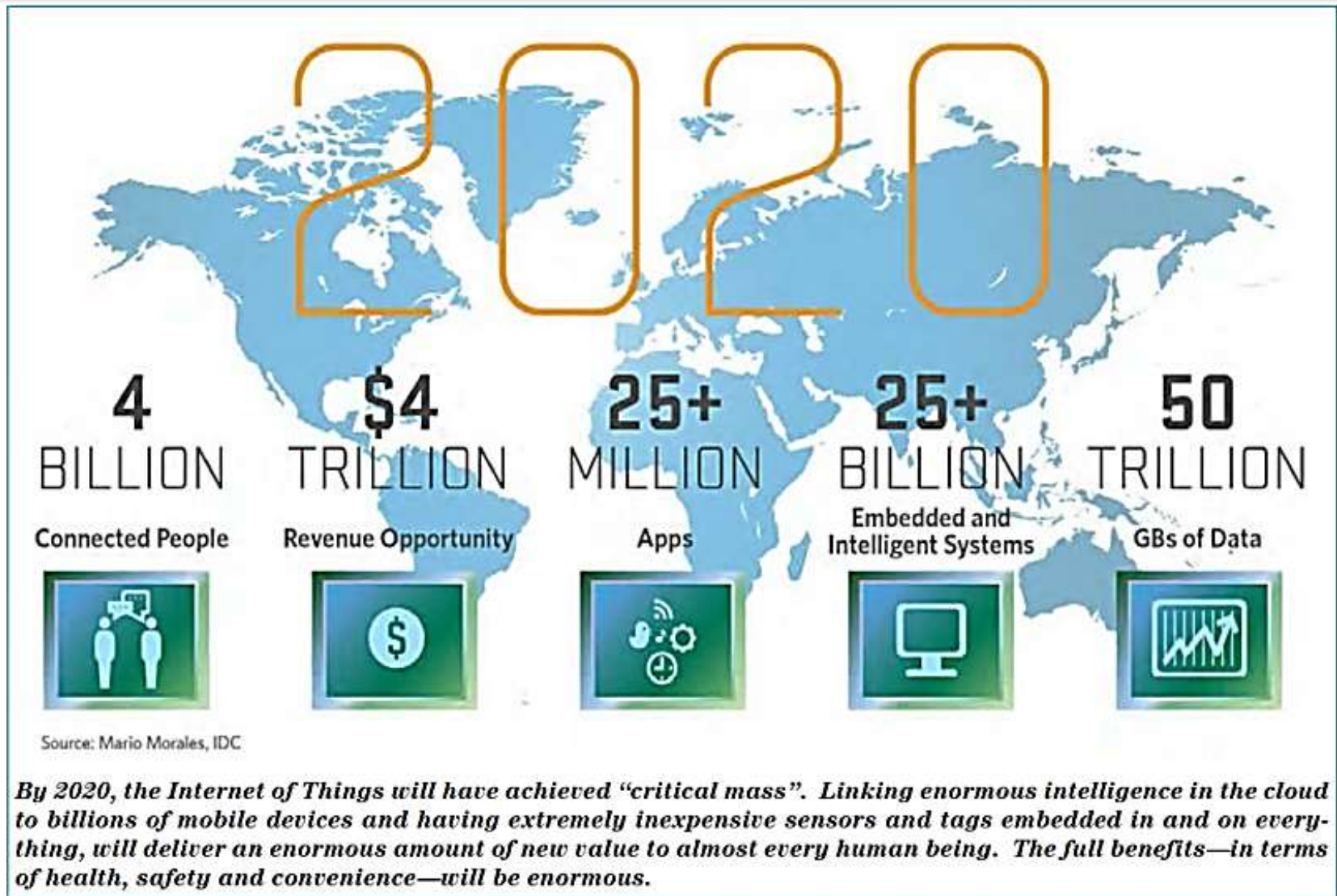
THE INTERNET OF THINGS

AN EXPLOSION OF CONNECTED POSSIBILITY



Nearly \$6 trillion will be spent on IoT solutions over the next five years.

Growth In The Internet Of Things



Cisco predicting \$19 trillion its forecast for the economic value created by the “Internet of Everything” in the year 2020. “This is the largest growth in the history of humans,

Early Adapters & Examples



Early Adapters & Leaders

- **Bosch:** Industry 4.0 - from vision to implementation
<https://www.youtube.com/watch?v=1vZYvAcU8hY>
- **Siemens:** Industrie 4.0 - The Fourth Industrial Revolution
<https://www.youtube.com/watch?v=HPRURtORnis>
- **Mercedes :** Industry 4.0 - Next Steps
<https://www.youtube.com/watch?v=XZF10XrowGU>
- **Industry 4.0 in the Volkswagen Group**
<https://www.youtube.com/watch?v=MZkY9HNCiM0>
- **Smart Manufacturing: The Brilliant Factory (GE)**
<https://www.youtube.com/watch?v=SfVUkGoCA7s>
- **Pilz: Industrie 4.0 - "Smart Factory"**
<https://www.youtube.com/watch?v=wpTXt4VBe94>
- **What is Smart Manufacturing**
<https://www.youtube.com/watch?v=Hcq4e9D4uL8>
- **Industry 4.0: Integrated Industry reaches the next level**
<https://www.youtube.com/watch?v=ccB6e18VwsQ>

Reference Sectors



Early Reacting Sectors & Application Areas

- General Industry,
- Automotive,
- Consumer Electronics,
- Energy, (Renewable Green Energy)
- Agriculture, (Vertical Farming)
- Construction, Smart Houses,
- Smart Cities,
- Healthcare,
- Etc.....



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